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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Radu Bilcu

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WARE FRESSOLA VAN DER SLUYS & ADOLPHSON, LLP
BRADFORD GREEN, BUILDING 5
755 MAIN STREET, P O BOX 224
MONROE, CT 06468

EXAMINER

ODOM, CURTIS B

ART UNIT

PAPER NUMBER

2611

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/554,042	Applicant(s) BILCU ET AL.	
	Examiner CURTIS B. ODOM	Art Unit 2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 November 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-8 and 10-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3,4,7,8,10,11,13 and 14 is/are rejected.
- 7) ☒ Claim(s) 5,6 and 12 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1 and 3-8, and 10-14 have been considered but are moot in view of the new ground(s) of rejection.

Claim Objections

2. Claims 3, 5, 10, and 12 are objected to because of the following informalities: The claims recite the **interpolated filtered signal** is used to adapt the properties of the interpolation. However, in claims 3, 5, 10, and 12, it is the understanding of the Examiner that the **filtered signal (y(n) before interpolation)** and the error signal adapt the properties of the interpolation and are inputs to the for the algorithm to adapt the properties of the interpolation (see Fig. 6, of the instant specification). Therefore, throughout the remainder of the Office Action, the Examiner will examine the claims with the interpretation that the **interpolated filtered signal** is actually the **filtered signal** in light of the specification. Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 2611

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 3, 4, 7, 8, 10, 11, 13, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art (AAPA) in view of Yamazaki et al. (U. S. Patent No. 7, 054, 088).

Regarding claim 1, AAPA discloses a method (see instant specification) for filtering (see Fig. 1) comprising adaptive filtering $W(n)$ an input signal (see page 3, lines 19-30), interpolating (l) a filtered signal by recreating removed samples (see page 3, lines 19-30) to provide an interpolated filtered signal, interpolating (l) the input signal, $x(n)$, by recreating removed samples (see page 3, lines 19-30) for adapting the adaptive filtering through LMS as shown in Fig. 1 and described on page 3, line 27-page 6, line 14.

AAPA does not disclose adapting properties of an interpolation of the filtered signal in response to an error signal indicative of a difference between a desired signal and the interpolated filtered signal. However, Yamazaki et al. discloses filtering a signal (see Fig. 5A, block 56) and interpolating the filtered signal using an interpolation filter (see Fig. 5B, block 64) to produce a filtered interpolated signal, wherein the properties of the interpolation filter are adapted by adjusting tap coefficients according to an phase error signal output from error detector 76 (Fig. 5B) indicative of a difference between a desired signal output from Viterbi Decoder 66 (Fig. 5B) and the interpolated filtered signal (y), see column 13, line 66-column 14, line 24. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the method of the Applicant's Admitted Prior Art with the teachings of

Art Unit: 2611

Yamazaki et al. since Yamazaki et al. states phase and frequency synchronization can be obtained in a short time using the device/method (see column 14, lines 26-32).

Regarding claim 3, AAPA discloses a method (see instant specification) for filtering (see Fig. 1) comprising adaptive filtering $W(n)$ an input signal (see page 3, lines 19-30), interpolating (I) a filtered signal by recreating removed samples (see page 3, lines 19-30) to provide an interpolated filtered signal, interpolating (I) the input signal, $x(n)$, by recreating removed samples (see page 3, lines 19-30) for adapting the adaptive filtering through LMS as shown in Fig. 1 and described on page 3, line 27-page 6, line 14.

AAPA does not disclose providing a reference signal, and combining an interpolated filtered signal and the reference signal for forming an error signal and adapting properties of an interpolation according to the error signal and the filtered signal. However, Yamazaki et al. discloses filtering a signal (see Fig. 5A, block 56) and interpolating the filtered signal using an interpolation filter (see Fig. 5B, block 64) to produce a filtered interpolated signal, wherein the properties of the interpolation filter are adapted by adjusting tap coefficients according to a phase error signal output from error detector 76 (Fig. 5B) indicative of a difference between a reference signal output from Viterbi Decoder 66 (Fig. 5B) and the interpolated filtered signal (y), see column 13, line 66-column 14, line 24. The error signal is sent to a loop filter (Fig. 5B, block 74) which also receives a frequency offset and phase offset of the filtered signal (see column 13, lines 4-15 and column 14, lines 5-23) to adapt the properties of the interpolation. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the method of the Applicant's Admitted Prior Art with the teachings of

Art Unit: 2611

Yamazaki et al. since Yamazaki et al. states phase and frequency synchronization can be obtained in a short time using the device/method (see column 14, lines 26-32).

Regarding claim 4, Yamazaki et al. discloses changing tap coefficients of the interpolation filter to adapt the interpolation (see column 14, lines 5-23). It would have been obvious to include this feature since Yamazaki et al. states phase and frequency synchronization can be obtained in a short time using the device/method (see column 14, lines 26-32).

Regarding claim 7, AAPA discloses using FIR filtering for adaptive filtering (see page 3, lines 19-30).

Regarding claim 8, the claimed apparatus includes features corresponding to the above rejection of claim 1, which is applicable hereto.

Regarding claim 10, the claimed apparatus includes features corresponding to the above rejection of claim 3, which is applicable hereto.

Regarding claim 11, the claimed apparatus includes features corresponding to the above rejection of claim 4, which is applicable hereto.

Regarding claim 13, AAPA discloses an adapting block (LMS) for adapting the properties of the adaptive filter, see also page 3, line 27-page 6, line 14.

Regarding claim 14, the claimed apparatus includes features corresponding to the above rejection of claim 7, which is applicable hereto.

Allowable Subject Matter

5. Claims 5, 6, and 12 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form (and above objections are overcome) including all of the limitations of the base claim and any intervening claims.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to CURTIS B. ODOM whose telephone number is (571)272-3046. The examiner can normally be reached on Monday- Friday, 9-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shuwang Liu can be reached on 571-272-3036. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2611

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Curtis B. Odom/
Primary Examiner, Art Unit 2611
January 31, 2009